

region capable of directing transport of said enzyme into a plastid, operatively linked to said DNA sequence.

AP3  
cont'd  
3. (Amended) The recombinant construct of claim 1, wherein said promoter is a plastid specific promoter and said recombinant construct further comprises:

a gene encoding a selectable marker for selection of plant cells comprising a plastid expressing said selectable marker, and

DNA regions of homology to the genome of said plastid, wherein said DNA regions of homology flank said plastid specific promoter, said DNA sequence, said transcription termination signal sequence, and said gene encoding a selectable marker.

4. (Amended) The recombinant construct of claim 1, wherein said promoter is a plastid specific promoter and said recombinant construct further comprises a ribosome binding site joined to said promoter.

5. (Amended) The recombinant construct of claim 4, wherein said ribosome binding site is obtained from a leader sequence selected from the group consisting of a plastid leader sequence, a bacterial leader sequence, and a bacteriophage leader sequence.

PH  
7. (Amended) A recombinant vector comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a plastid specific promoter, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence.

AS  
9. (Amended) A transformed host cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a plastid specific promoter, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence.

PL  
11. (Amended) A plant comprising at least one transformed host plant cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a plastid specific promoter, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence.

12. (Amended) A seed comprising at least one transformed host plant cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a plastid specific promoter, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence.

13. (Amended) A plant, the genome of which comprises introduced DNA encoding a steroid 5 $\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA.

PL  
17. (Amended) The plant of claim 13, wherein the seed of said plant contains at least one of brassicastanol, brassicastanol ester, stigmastanol or stigmastanol ester.

P. 1  
contd.

18. (Amended) The plant of claim 13, wherein said regulatory signals cause seed-specific expression of said introduced DNA, and wherein said introduced DNA is further operatively linked to a transit peptide coding region capable of directing transport of said enzyme encoded thereby into a plastid.

19. (Amended) The plant of claim 13, wherein said regulatory signals cause plastid-specific expression of said introduced DNA, and wherein said genome is a plastid genome.

P. 2

34. (Amended) A seed of a plant, the genome of which comprises introduced DNA encoding a steroid  $5\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, wherein said seed comprises said introduced DNA.

35. (Amended) Progeny of a plant, the genome of which comprises introduced DNA encoding a steroid  $5\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, wherein said progeny comprises said introduced DNA.

36. (Amended) A method of producing a plant that accumulates an elevated level of a compound selected from the group consisting of sitosterol, at least one sitosterol ester, sitostanol, at least one sitostanol ester, and mixtures thereof, in seed of said plant compared to seed of a

AS  
control

corresponding plant comprising no introduced DNA encoding a peptide, polypeptide, or protein that affects the biosynthesis and accumulation of a phytosterol or phytosterol ester, or a phytostanol or phytostanol ester, comprising sexually crossing a plant, the genome of which comprises introduced DNA encoding a steroid 5 $\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, with said corresponding plant.

37. (Amended) A plant produced by the method of claim 36, wherein said plant comprises said introduced DNA.

38. (Amended) A method of producing oil containing sitostanol or a sitostanol ester, comprising culturing cells from a plant, the genome of which comprises introduced DNA encoding a steroid 5 $\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, for a time and under conditions conducive to the production of oil containing sitostanol or sitostanol ester, and recovering said oil containing sitostanol or a sitostanol ester produced thereby.

39. (Amended) A method for producing a sitostanol or a sitostanol ester comprising culturing cells from a plant, the genome of which comprises introduced DNA encoding a steroid 5 $\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that

cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, for a time and under conditions conducive to the production of sitostanol or a sitostanol ester, and recovering said sitostanol or sitostanol ester produced thereby.

40. (Amended) A plant, the genome of which comprises introduced DNA encoding a steroid  $5\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, wherein said plant is an apomictic plant.

41. (Amended) A seed resulting from a cross of a plant, the genome of which comprises introduced DNA encoding a steroid  $5\alpha$ -reductase enzyme, wherein said introduced DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said introduced DNA, and wherein seeds of said plant contain an elevated level of sitostanol, at least one sitostanol ester, or a mixture thereof, compared to seeds of an otherwise identical plant, the genome of which does not comprise said introduced DNA, wherein said plant is an apomictic plant, with a nurse cultivar, wherein said seed comprises said introduced DNA.

42. (Amended) A method of producing a compound selected from the group consisting of at least one phytosterol, at least one phytosterol ester, at least one phytostanol, at least one phytostanol ester, and mixtures thereof, in a seed, comprising obtaining a transformed plant that produces said seed, wherein said plant has and expresses in its genome DNA encoding a steroid  $5\alpha$ -

reductase enzyme, wherein said DNA is operatively linked to regulatory signals that cause seed-specific or plastid-specific expression of said DNA, and recovering said compound from said seed.

46. (Amended) The method of claim 42, wherein said regulatory signals cause seed-specific expression of said DNA, and wherein said DNA is further operatively linked to a transit peptide coding region capable of directing transport of said steroid 5 $\alpha$ -reductase enzyme into a plastid.

47. (Amended) The method of claim 42, wherein said regulatory signals cause seed-specific expression of said DNA, and wherein said genome is the nuclear genome.

48. (Amended) The method of claim 42, wherein said regulatory signals cause plastid-specific expression of said DNA, and wherein said genome is a plastid genome.

70. (Amended) A uniform population of plants according to claim 13.

**Please enter new claims 71-82 as follows:**

71. (New) A recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a promoter functional in a plant plastid, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence, wherein said DNA sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, complements thereof, and degenerate sequences thereof.

72. (New) The recombinant construct of claim 71, wherein said promoter is a seed-specific promoter and wherein said recombinant construct further comprises a transit peptide coding

region capable of directing transport of said enzyme into a plastid, operatively linked to said DNA sequence.

73. (New) The recombinant construct of claim 71, wherein said promoter is a promoter functional in a plant plastid and said recombinant construct further comprises:

a gene encoding a selectable marker for selection of plant cells comprising a plastid expressing said selectable marker, and

DNA regions of homology to the genome of said plastid, wherein said DNA regions of homology flank said promoter functional in a plant plastid, said DNA sequence, said transcription termination signal sequence, and said gene encoding a selectable marker.

74. (New) The recombinant construct of claim 71, wherein said promoter is a promoter functional in a plant plastid and said recombinant construct further comprises a ribosome binding site joined to said promoter.

75. (New) The recombinant construct of claim 74, wherein said ribosome binding site is obtained from a leader sequence selected from the group consisting of a plastid leader sequence, a bacterial leader sequence, and a bacteriophage leader sequence.

76. (New) The recombinant construct of claim 75, wherein said ribosome binding site is selected from the group consisting of the binding site of the gene 10 leader and the rbcLRBS site.

77. (New) A recombinant vector comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a promoter functional in a plant plastid, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a

transcription termination signal sequence, wherein said DNA sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, complements thereof, and degenerate sequences thereof.

78. (New) The recombinant vector of claim 77, wherein said vector is a plant expression vector.

79. (New) A transformed host cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a promoter functional in a plant plastid, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence, wherein said DNA sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, complements thereof, and degenerate sequences thereof.

80. (New) The transformed host cell of claim 79, wherein said host cell is a plant cell.

81. (New) A plant comprising at least one transformed host plant cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed specific promoter or a promoter functional in a plant plastid, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence, wherein said DNA sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, complements thereof, and degenerate sequences thereof.

82. (New) A seed comprising at least one transformed host plant cell comprising a recombinant construct, comprising as operably linked components in the 5' to 3' direction, a seed



specific promoter or a promoter functional in a plant plastid, a DNA sequence encoding a steroid 5 $\alpha$ -reductase enzyme, and a transcription termination signal sequence, wherein said DNA sequence is selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, complements thereof, and degenerate sequences thereof.